



UF-1 Flight Readiness Review (FRR)

International Space Station Program November 15, 2001





Agenda



Mission Overview

Suzan Voss

Vehicle Readiness

- On-Orbit Status
- MPLM FOD

Steve Porter
Scott Gahring
Steve Shannon

Avionics/Software Readiness

- Solid State Mass Memory Unit (SSMMU) Plan

Richard Swaim

Summary

Suzan Voss





UF-1 Flight Readiness Review (FRR)

Mission Overview

**International Space Station Program
November 15, 2001**





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- UF-1 Launch Commit Criteria
- UF-1 ISS Program Status
- UF-1 Flight Summary



ISSP UF-1 Program Reviews



Launch Package Assessment (LPA), October 9, 2001

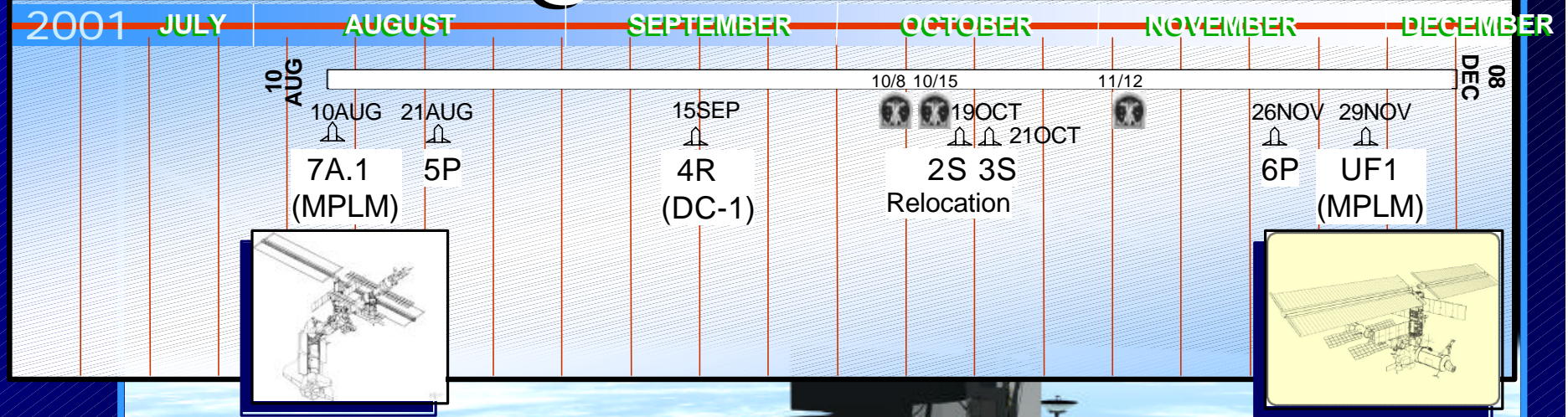
- Addressed the launch package readiness for integration into the Orbiter.
- Successfully completed and authorized to complete payload processing.

Stage Operations Readiness Review, October 30, 2001

- Addressed CoFR 1&2 requirements for cargo elements, middeck stowed hardware, launch package, personnel, facilities, and operations and their readiness to proceed to launch UF-1 on 11/29/01.
- Authorized to proceed to launch UF-1 with the following Exceptions and Action Items identified:

◆ Exception: 6P/UF1-SORR-01, Kolibri Experiment Safety Data Pkg	<u>ECD</u> 11/20/01
◆ Exception: 6P/UF1-SORR-02, EVA Contamination Issues	12/31/01
◆ AI: 6P/UF1 SORR-001, TVIS Contingencies	Closed
◆ AI: 6P/UF1 SORR-002, Payload Water Reservoir Identification	11/13/01
◆ AI: 6P/UF1 SORR-003, Solid State Mass Memory Unit Final Installation Plan	12/11/01
◆ Exception: Post-SORR CEVIS/Pre-Breathe Open Hazard Report	11/16/01
● 1 st flight to utilize MPLM late stow	
◆ Late stow demo 11/18	
◆ Late stow 11/20-21	

INCREMENT 3



Expedition 3 Crew



Frank Culbertson
(Commander)

Mikhail Tyurin
(Flight Engineer)

Vladimir Dezhurov
(Soyuz Pilot)



Denotes EVA

Increment 3

From 7A.1 Launch
August 10, 2001
To UF-1 Undock
December 8, 2001

Duration - 120 Days





Increment 3 Accomplishments



Executed Lab condensate water dump SDTO

Outfitted and activated Docking Compartment (DC-1)

Conducted three EVAs from DC-1

- **RS EVA-2 to partially activate DC-1**
- **RS EVA-3 to deploy the MPAC/SEEDs payload and Kromka**
- **RS EVA-4 to complete DC-1 activation and survey a segment of a Service Module solar array**

Relocated 2 Soyuz from FGB nadir to DC-1

Completed 2/3 Soyuz rotation and taxi crew mission

Tracking to pre-flight objectives to start of UF-1 pre-pack





Research Program Highlights



Meeting average weekly crew research time goals within 10%

Completed significant utilization objectives:

- **Installed version 2.0 software for EXPRESS racks 1, 2, & 4, resolving the Rack Interface Computer (RIC) lock-ups**
- **Completed 3 runs of H-Reflex (2nd Program run of the experiment)**
- **Significant number of ARIS ICE runs completed in preparation for microgravity-sensitive payloads in later Increments**
- **Significant number of operational hours for payloads requiring little crew interaction (e.g., DC-PCG, EXPPCS)**
- **Completed BSTC (biotech cell science) operations for Increment 3**
- **Completed Expedition 3 EarthKAM activities (involved over 17 schools and 2200 students)**



Increment 4 Overview



Increment 4 Data

UF-1 Launch Date:
November 29, 2001

Flight UF-2 Undock Date:
May 10, 2002

Duration:
162 days

Crew

Commander

Yuri Onufrienko

Flight Engineer 1

Carl Walz

Flight Engineer 2

Dan Bursch

UF-1 Stage Objectives

- R2 Software load installation, activation, and checkout
- Stow cargoes delivered by 6Progress and UF-1
- Perform 2 Russian EVAs using Orlan suits and Docking Compartment
- Perform US and Russian Utilization
- Perform ISS systems hardware replacement tasks
- Prepare ISS and crew for S0/MT Assembly tasks on flight 8A
- Maintain health and evaluate status of ISS crew and vehicle environment





6 Progress and UF1 Launch Dates Nominal Plan



Schedules

6 Progress: Dock November **28** (launch date - November 26)

Flight UF1: Launch November **29**

- **Crew time to unpack Progress prior to and during UF1 docked time is limited**
 - **Resolution**
 - **Joint US/Russian agreement:** Unpacking of 6 Progress will occur after UF1 undocks
 - **On-Orbit Summary approved by US and Russian specialists:** 6 Progress unpacking scheduled first 2 weeks after UF1 undock
- **6 Progress launch delayed**
 - Concern: 6 Progress launch during UF1 flight
 - **Resolution**
 - **Joint US/Russian agreement:** 6 Progress launch will not conflict with UF-1 docked operations. 6P will not dock while the Shuttle is docked to ISS.
 - **New Russian Information:** Resolved computer problem that was a risk to the launch date at SORR



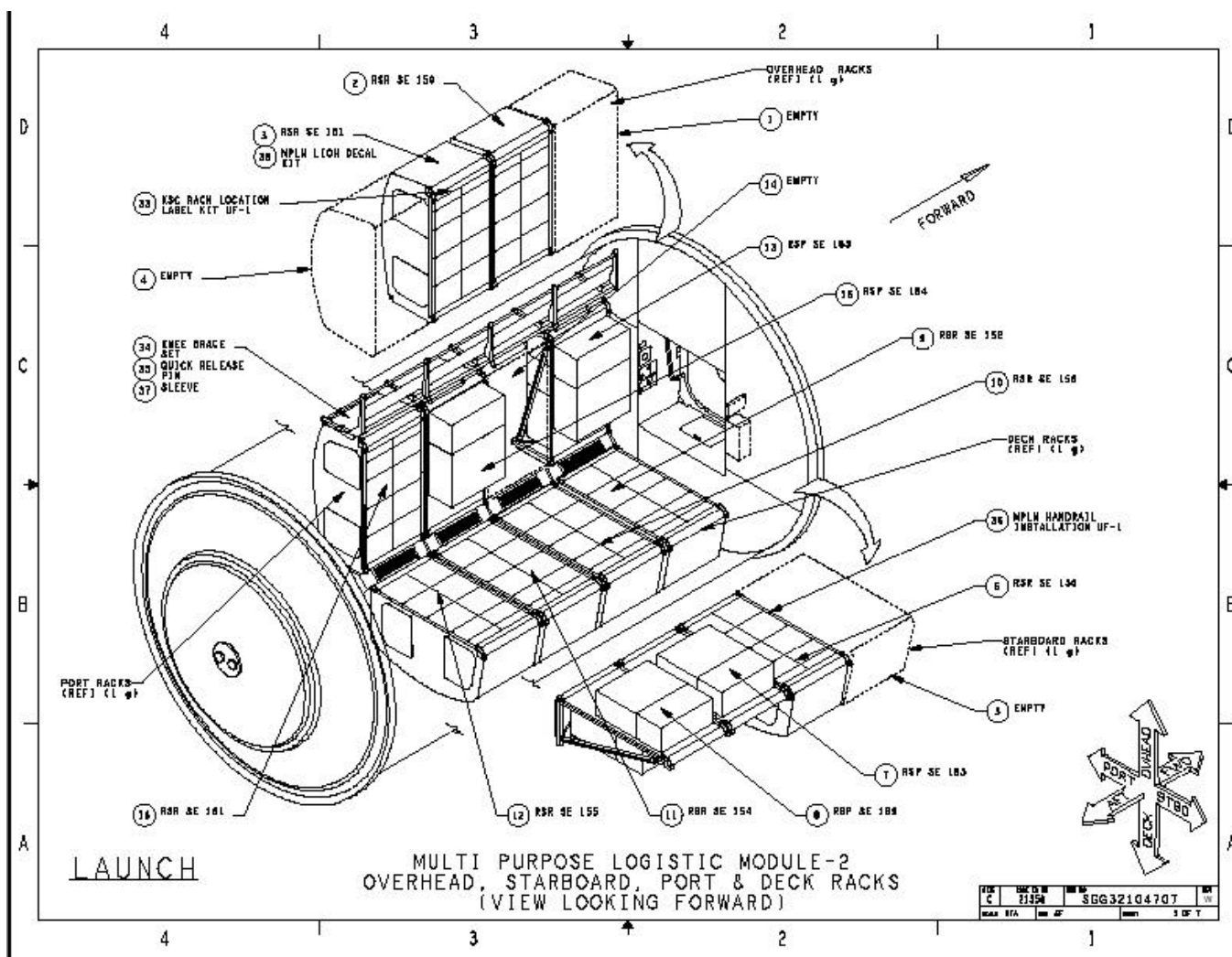


UF-1 Payload Stowage and Configuration layout (MPLM)



Stowage Racks

- ◆ 8 Resupply Stowage Racks (RSR)
- ◆ 4 Resupply Stowage Platforms (RSP)

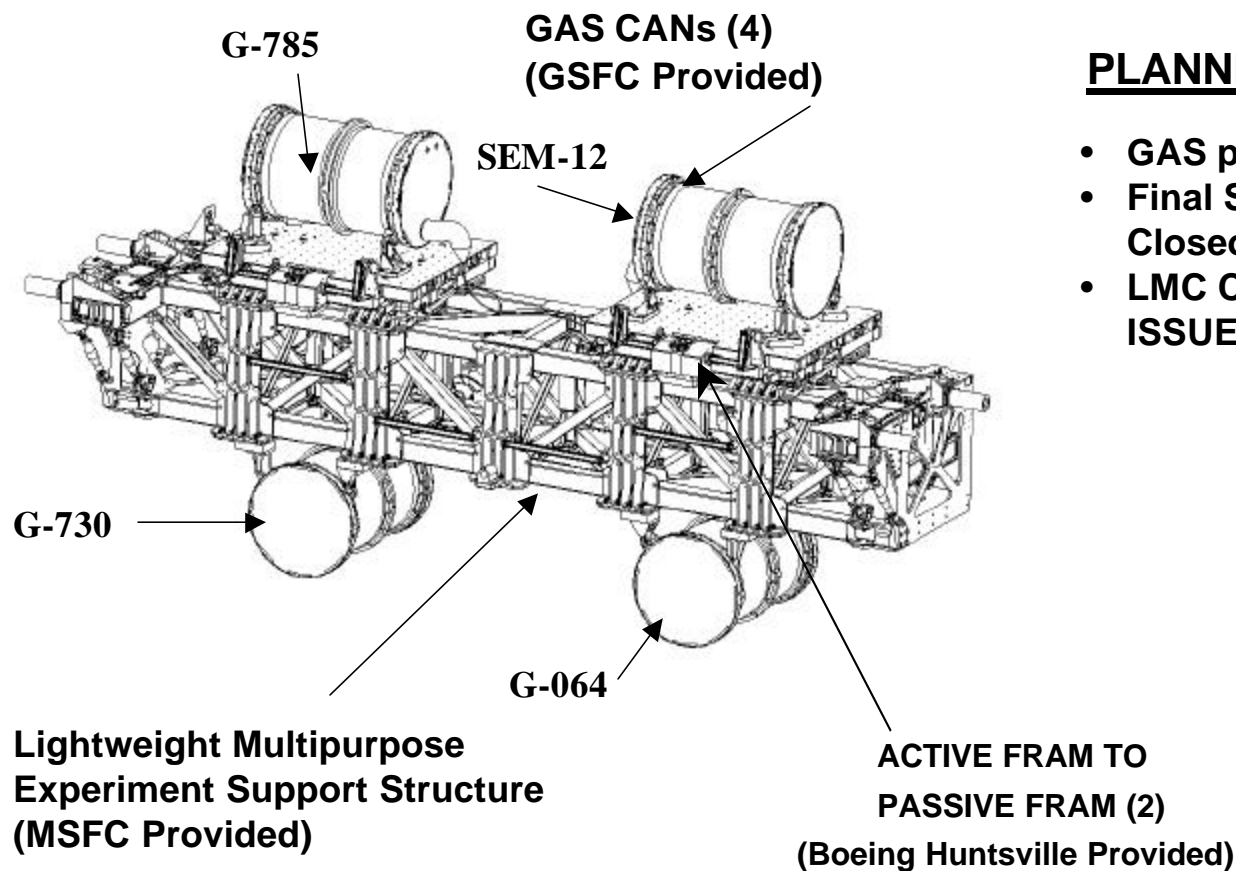




UF-1 Payload Stowage and Configuration layout (LMC)



LMC MISSION CONFIGURATION LAUNCH AND RETURN



PLANNED OPEN WORK SUMMARY

- GAS payload IVT planned 11/16
- Final Safety Verification Tracking Log Closeout 11/19
- LMC CARGO ELEMENT HAS NO ISSUES OR CONSTRAINTS



UF-1 Significant Hardware



MPLM

- Consumables
 - 65 Food Containers; 2 CWCs water
 - 52 CTBEs of Crew Clothing & Provisions
 - 2 CTBEs Photo/TV Re-supply Bag
- 28 CTBEs CHeCS (TVIS, IRED, VOA, WMK, AMK)
- 12 CTBEs Utilization Hardware
- 1.5 CTBEs Avionics (SSMMU cards, MDM on-orbit tester)
- 17.5 CTBEs EVA hardware (EMU hardware, SAFER, tools)
- 10 CTBEs ORUs/Spares
- 19 CTBEs Logistics and Maintenance
- 2 CTBEs Photo/TV Resupply
- Utility Outlet Panels (6)
- Temporary Sleep Station (TESS) Bricks
- 8A Preposition Items (S0 Cables (2), Circuit Interrupt Devices (2), CETA Luminaires, LiOH Canisters (7), CWC (6), EVA ORU Transfer bags (2))

MIDDECK

- CHeCS Crew Rotation Hardware (Medical Packs)
- Crew Rotation Hardware (3 IELKs, Seat Rail Kits)
- Photo/TV Equipment
- ESEL Tools and EMU (3rd EMU, battery and tools)
- Utilization
 - Powered payloads
 - Commercial Biomedical Testing Module
 - Avian Development Facility
 - Biotechnology Refrigerator -#3
 - Protein Crystal Growth Single Thermal Enclosed Sys (2)
 - Hoffman Reflex Experiment Kit





UF1 Mission Priorities (ISS)



1. Rotate Expedition 3 crew with Expedition 4 crew, transfer mandatory crew rotation cargo and crew handover with 30-minute ISS safety brief. [IVA]
2. Transfer food and water of mandatory quantities. [IVA]
3. Transfer critical 8A assembly cargo to ISS and fill 2 Payload Water Reservoirs (PWR) for UF-1 Stage support. [IVA]
4. Transfer remaining crew rotation, resupply, and provisioning hardware/supplies to ISS. [IVA]
5. One shuttle based EVA to accomplish the following tasks (4 hours in length): [EVA][Robotics]
 1. Install BGA thermal blankets (4B and 2B)
 2. Retrieve the S-Band Antenna Structure Assembly (SASA) blanket
 3. Perform maintenance on starboard solar array 4 bar linkage
 4. 8A EVA get ahead activities including EVA tool retrieval, CIDS 7&8 preposition
 5. Photo documentation of Z1 BSP heat pipe radiator and Z1 DDCU heat pipe radiator
6. Transfer and activate powered Shuttle middeck Utilization cargo to ISS and return powered experiment cargo from ISS to Shuttle middeck. [IVA][Utilization]
7. Transfer remaining Utilization cargo to and from ISS. [IVA][Utilization]
8. Transfer and stow remaining cargo to and from ISS. [IVA]
9. Increase ISS crew handover time to 16 hours for each CDR. [IVA]
10. Perform Oxygen (O₂) transfer test (ORCA test) between Orbiter and ISS [IVA]
11. Perform Hoffman Reflex activities with Expedition 4 crewmembers. [IVA][Utilization]
12. Perform daily payload activity for Commercial Biotechnology Testing Module (CBTM). [IVA][Utilization]





UF1 Mission Priorities (ISS) (Continued)



The Pre-Mission Timeline Does not accommodate tasks below this line except for tasks identified with ✓

.....

- Perform Treadmill Vibration Isolation System (TVIS) Maintenance. (can be deferred to Stage UF-1) [IVA]
- ✓ • Perform daily activities and maintenance operations for powered middeck experiments. [IVA] [Utilization]
- ✓ • Reboost the ISS to no more than 215 nmi (387 km) average orbital altitude [IVA]
- ✓ • Perform DTO 700-22 Crew Return Vehicle (CRV) Space Integrated Global Positioning System/Inertial Navigation System (SIGI). [DTO] [IVA]
- ✓ • Remove and Replace ISS Radiation Area Monitors (RAMs). [IVA]
- Remove and replace 6 Utility Outlet Panels (UOPs). (can be deferred to Stage UF-1). [IVA]
- ✓ • Swap out 3 SSC laptop shells. (can be deferred to Stage UF-1) [IVA]
- Increase ISS crew handover time to 20 hours for each CDR and 16 hours for each Flight Engineer [IVA]
- Empty 5 PWRs and fill 5 additional PWRs (7 total) [IVA]



UF1 Mission Priorities (ISS) (Concluded)



- ✓ 22. Perform SDTO 15004-U ISS Control of Partial Pressure of Carbon Dioxide Levels in the Space Shuttle to Reduce Shuttle LiOH Usage [IVA]
- ✓ 23. Perform MPLM dew point measurement prior to closing hatch and unberthing MPLM [IVA]
- 24. Perform DTO 262 On-Orbit Bicycle Ergometer Loads Measurement (DTO of opportunity)(Details of the DTO are specified in NSTS 16725, Flight Test and Supplementary Objectives Document) [IVA]
- ✓ 25. Flyaround
- ✓ 26. Reboost the ISS to 221 nmi (400 km) average orbital altitude [IVA]
- 27. Remove and replace 10 High Efficiency Particulate Accumulator (HEPA) bacteria filters (can be deferred to Stage UF-1). [IVA]
- ✓ 28. Perform SDTO13005-U, ISS Structural Life Validation and Extension, for UF-1 orbiter undocking. [IVA]



Launch Commit Criteria



- **UF-1 Cargo Element Launch Commit Criteria**
 - None
- **ISS Stage Driven Launch Commit Criteria**
 - One of two APCU's
 - Single fault tolerant to a visual MPLM berthing cue (OSVS, CBCS, or AVU)
- **No mandatory hardware for crew rotation in MPLM**
- **Standard Generic Launch Commit Criteria**



ISS Program Status



- **ISS Increment 4**
 - On-board consumables plus those manifested on Flights 6P, UF-1 and 7P support the planned 160-day Increment +45-day skip cycle.
 - Limiting consumable: food.
 - Duration of limiting consumable (at 0.9 container/day):
 - No 6P, no UF1: food at 45 day skip cycle no earlier than 12/28/01
 - 6P docked, no UF1: food at 45 day skip cycle no earlier than 2/09/02
- **Management Integration Office/Configuration Management**
 - All approved changes, including waivers and exceptions have been verified for incorporation into the baseline.
 - 0 Pending waivers
 - 0 Pending exceptions are a constraint to STS-108 launch
- **Program Integration Office**
 - Program Integration has no constraints to the UF-1 Launch.
 - Prop, altitude, and power balance all have positive margins.
 - SSRMS/CSA is ready to support Mission/Stage requirements.
 - MPLM launch/landing loads analysis is acceptable for all mission phases (return constraints defined; multiple cases analyzed with positive margins).





ISS Program Status



- GFE Office

- All forward work has been identified and planned for this mission. Any exceptions have been identified in this briefing. GFE Flight Projects Office is ready to proceed with the launch of UF-1/STS-108.

- ISS Payloads

- Manifest and timeline supports research objectives for the flight and delivery of hardware for the stage.
- ISS Payload is go and ready to support the UF-1 Flight.

- S&MA

- All hardware and software certifications are complete or will be complete prior to launch.
- US and Russian Certification schedules support launch date.





Vehicle Office

ISS Vehicle Office Flight Readiness Review



11/15/01



AGENDA



On-orbit Status

Gahring

Special Topic:

•MPLM FOD

Shannon



On Orbit Status

Scott Gahring





Flight 7A.1 Configuration





Hardware Status



Issues	New Since 7A.1 SORR	Impact to UF-1 Operations	Topic to be Presented	Additional Ground Testing or Open Work	On-Orbit Repair scheduled or required
BGA Rotation High Current	No	Yes	No	No	No
RSR FOD	Yes	No	Yes	No	No
O2/N2 Valve	No	No	No	No	No
ITCS	Yes	No	No	No	Yes
CMG – Outer Gimbal Bias, Current Spikes, Loss of Comm	No	No	No	Yes	No
TVIS	No	No	No	Yes SPD's	Yes
UOP Changes	No	No	No	No	Yes
RPCM Health Flags	Yes	No	No	No	No
CEVIS	Yes	No	No	No	Yes
MCA Operations	No	No	No	Yes	Yes
Vozdukh Operation on 2 of 3 CO ₂ Beds	No	No	No	No	Yes
SM Rapid Depress Algorithm Disabled	No	No	No	Yes	Yes
SM Air Conditioner #2	No	No	No	No	Yes



What is out of Configuration



TVIS SLD's using Bungee configuration

CEVIS wire rope interfaces out of certified configuration, foot pedal non-op

ZOE recorder not utilized

MCA has limited life – will be managed operationally

One RPCM that cannot be refreshed

Workarounds due to UOP trips

SM Battery string down

1 of 4 Beta Gimbal Assembly (BGA) latching mechanisms not locked on starboard 4 bar assembly - no impact

Vozdukh operating on 2 of 3 CO₂ beds - no impact

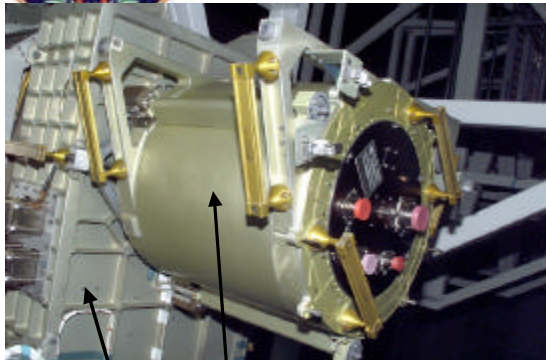
CDRA operates on single bed - no impact

SM rapid depress algorithm disabled - no impact (Lab provides function)





BGA High Current Anomaly Status



Beta Gimbal Assembly
Solar Array Wing Platform



Mockup Thermal Blanket
installed on NBL BGA

Observation:

- 2B and 4B Beta Gimbal Assemblies (BGAs) exhibiting anomalous high motor currents during rotation

Discussion:

- Forward plan accepted at SSPCB on 10/26/01:

- ◆ Do not R&R 4B BMRRM on UF-1

- ▲ R&R becomes contingency operation

- ◆ Begin low solar beta XPOP operations starting 11/10/01

- ▲ Complete coordination with RSA and payloads community

- ◆ Install thermal blankets on 2B and 4B BGAs during UF-1 flight or stage

- ▲ UF-1 flight selected at SORR

Risk assessment: Low

Acceptable for Flight: Yes

Status: Blankets delivered to KSC on 11/6/01, obtained RSA agreement for low solar beta XPOP





On-Orbit Summary



**None of the identified items for investigation
regarding the on-orbit configuration represent a
constraint to the flight of UF-1**

**The MER/ESR personnel and facilities will be ready
to support**





MPLM FOD Issue

Steve Shannon





FOD Mitigation Approach for UF-1



Reclean all RSRs using improved process

- Borescope and vacuum all RSRs. Rotate, blow down with compressed air all RSRs outside MPLM

Tape/closeout all RSRs, including locker interiors

- Combination of taping and foam blocks stop migration paths

Clean MPLM FM-2, Borescope, vacuum, & inspect behind Y & Z panels

Operational Aspects

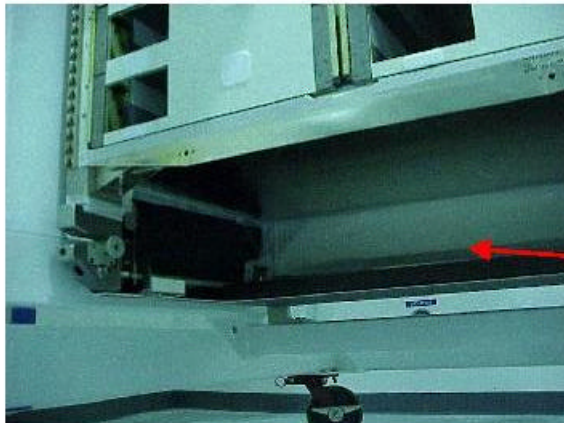
- **Air Circulation**
 - ◆ MSFC ECLSS working flight rule for air circulation prior to ingress.
- **Crew Protective Gear**
 - ◆ Crew protective gear (safety glasses and masks) are on board ISS (3 sets) or on the UF-1 manifest (7 sets). Crew to wear protective gear during bag removal.
- **Cargo Inspection**
 - ◆ UF-1 Launch Package Team working with crew/MOD to obtain detailed call downs regarding location of any FOD found during UF-1 operations.

FOD concern mitigated for the UF-1 mission. MPLM FM-2 and RSRs are ready to fly.





Taping in RSR Locker



- Foam insert in bottom of RSR



Avionics & Software Office NASA and Boeing

UF-1 Flight Readiness Review

November 15, 2001

Richard Swaim- Boeing





Avionics & Software UF-1 Agenda



Avionics UF-1 mission highlights

- MDM On-Orbit Tester (MOOT) launch
- Solid State Mass Memory Unit (SSMMU) upgrades
- 8A flight software transition pre-positioning

On-orbit avionics system status

Software loads and plan-to-launch

Summary



MDM On-Orbit Tester (MOOT)



Utility Power Strip
and cable to UOP

Keying
Plate
(3 types)

RT Address Jumper - 1 wire
SCSI Jumpers - 18 wires (C&C, P/L only)
HRDL F.O. Jumper

MOOT Test Application
Software (TAS) is loaded and
executes in E/IOCU DRAM

Representative
of all MDM's

SSMDM

1553 BIA
2 wires
- 1553 Hi
- 1553 Lo

RS-422/485
6 wires
- Enable, GND
- Transmit (2)
- Receive (2)

LAPTOP

**PCS
Power Cable**
- 120 vdc hi
- 120 vdc rtn
- Ground

**MOOT Test Control
Software (TCS) executes on
Laptop**
OC/S. Voss



Command and Data Handling Hardware Solid State Mass Memory Unit (SSMMU)



Solid State Mass Memory Unit (SSMMU) is the replacement for the magnetic disk storage currently used in the CCS & P/L systems main processors (MDMs)

Confidence testing program successfully completed 10/1/01

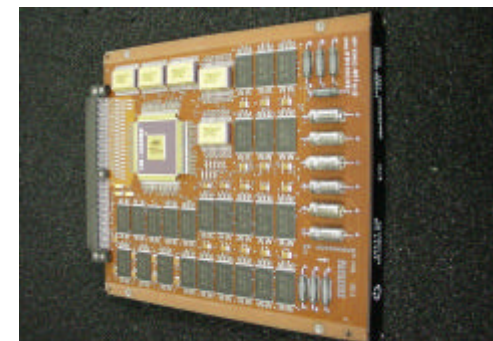
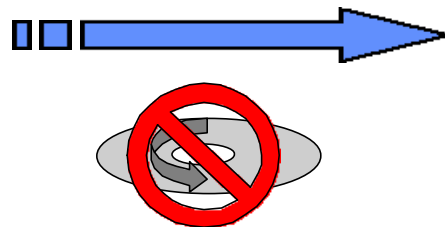
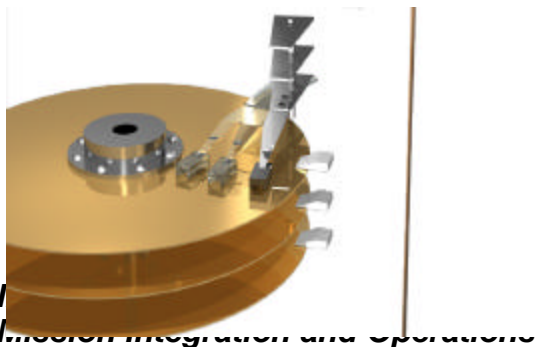
- Endurance (>90 days monitored operation @ 3x CCS nominal rates)
- Stress (max disk performance & max I/O interference)
- CCS (R1/R2) & PEP (R2/R3) FQT Formal Demonstrations (includes mixed fleet)
- HSI operational scenarios & end-to-end tests (mixed fleet / off-nominal tests)

Authorization to proceed with on-orbit yellow tag removal 10/30/01

Successful End-to-end PL-1 operations checkout (MCC/POIC/ISIL) 11/6/01 MCT

Phased installation schedule leading to on-orbit fleet upgrade by ~2/1/02

- Initial installation in PL-1, accumulate ~30 days run-time prior to CCS upgrade
- Accumulate ~30 days run-time on first CCS unit prior to additional CCS upgrades
- 5th SSMMU set to be used as a load source to minimize 8A up-link requirements





Command and Data Handling Hardware Solid State Mass Memory Unit (SSMMU)



Two SSMMUs on-orbit

- 1 PL-1 Installation
- 1 CCS R1 load

Three SSMMUs at KSC for UF-1 Launch (2 MPLM / 1 Mid-Deck)

- 1 blank (PL-2 Target)
- 1 CCS R1 load
- 1 CCS R1/R2 UF1-2.0 load (Yellow-Tagged for application software maturity)

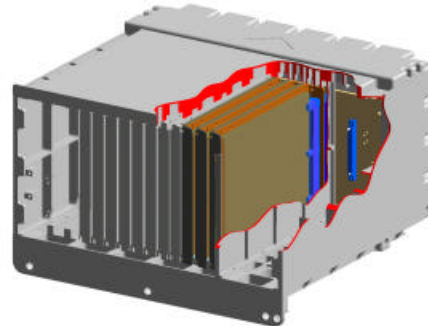
SSMMU#5 CCS R1/R2 Load Contents	Rel ID	Rel Date	Maturity 10/30/01	Comments
CCS R2 (2.8.1) Executable file	2.8.1	5/31/01	FQT	
CCS R2 Data Display Control Tables for PCS 013	2.8.1	10/17/01	TRR	FQT - 12/10/01
CCSR2 Patches & PPLs		10/4-11/5	Eng	FQT - 12/10/01
R2 Final Patch		10/4/01	TRR	FQT - 12/10/01
R2 PPL Patches		10/4/01	TRR	FQT - 12/10/01
Seal Break PPL/Patch/Cksum		10/16/01	TRR	FQT - 12/10/01
CCS Config Table		10/22/01	TRR	FQT - 12/10/01
GNCR2/ HB	gnc8a_1_1	6/28/01	FQT	
MSS/ CSA	ER2	10/22/01	Eng	FQT - 1/24/02



SSMMU Installation Training Expedition 4 Crew



Walz / Bursch





Avionics On-Orbit Status



C&T

- One Video Tape Recorder (VTR) operating nominally
- Ku-Band system operating Open-Loop / Closed-Loop Option for XPOP
- S-Band, Ku-Band, Audio, and Video subsystems ready for UF-1 support

GN&C

- Bias in CMG2 outer gimbal reported angle still stable
- Offset correction capability available w/GNC R2 release

C&DH

- Only subsystem with new hardware during UF-1 (SSMMU & MOOT)
- On-orbit processing systems operating nominal

No constraints for UF-1 launch





Avionics Software - Flight Load Status



IFL UF-1 1.0

Released 10/4/01

- **SSMMU Installation support**
 - ◆ High Rate Data Link (HRDL) firmware, MDM Loader Utility v2, PEP R2 Patch V3
- **Payload Configuration Files UF1 Final**
- **INTSYS R1 Patch V01 - ITCS Pump Patch**
- **LSYS3 PPL ADO 90, Instance 3 - VS CCT Thresholds**

IFL UF-1 1.0.1 CHeCS Firmware (SIF 01-358)

Released 10/11/01

IFL UF-1 1.1 UF-1 GNC R1 Flight PPLs

Released 10/26/01

IFL UF-1 1.1.1 UF-1 MSS Recon files

Released 11/09/01

IFL UF-1 1.2 UF-1 to 8A Transition / CCS & GNC R2 Support

Released 11/02/01

IFL UF-1 1.3 Stage Ops

Released 11/14/01

IFL UF-1 2.0 CCS R1/R2 SSMMU load

Released 10/29/01

- Yellow-Tagged for completion of forward work as noted on SSMMU charts

PCS

- Existing 7A.013 Patch 1 used for UF-1
- Launching 8A.015 8A-11A support CD (yellow-tagged)

Station Program Notes (SPNs)

- New CD launched w/UF-1 includes 679 current SPNs





Avionics & Software Summay



On-Orbit systems ready for UF-1 support

No IFIs or Chits constraining UF-1 launch or operations

Applicable stage testing completed w/7A.1 (5/01)

Certified NASA & Boeing staff ready to support MER operations

Software Development and Integration Lab (SDIL) prepared to reconfigure and staff for in-flight anomaly resolution

ISS Avionics and Software are ready to support UF-1 objectives





UF-1 Flight Readiness Review (FRR)

Summary

**International Space Station Program
November 15, 2001**





UF-1 Flight Summary



- Flight objectives and priorities are defined.
- Flight manifest has been defined.
- Hardware delivery and processing schedule supports launch date.
- All hardware and software certifications are complete or will be complete prior to launch.
- US and Russian certification schedule supports launch date.
- Personnel and facilities are ready to support.
- Special topics have been resolved or have acceptable operational workarounds.

**The ISS Program is ready to proceed with the
Launch of ISS UF-1/STS-108**



Back-Up Slides

Current On-Orbit Status

- C&DH
 - All Station MDMs operating
 - Node - N1-2 primary, N1-1 secondary
 - Photovoltaic Control Unit (PVCU) - 2B backup, 4B primary
 - FGB - 1 on, 2 off
 - SM - Loaded with version 5.0 software
 - SMTCs - all in redundant set
 - SMCCs - all in redundant set
 - Lab
 - C&C 3 primary, C&C 1 backup, C&C 2 standby
 - INT systems 1 operating, INT systems 2 off
 - Lab Aft 1, 2, 3 operating
 - Power Management Controller Unit (PMCU) 1 off, PMCU 2 on
 - GNC 1 backup, GNC 2 primary
 - Payload 1 off, PL 2 primary

Current On-Orbit Status

(continued)

- C&T
 - S-band high/low data rate operating nominally
 - SM Regul System operating on 1 of 3 strings
 - Audio system
 - Internal Audio Controller (IAC) 1 active, IAC-2 off

Current On-Orbit Status

(continued)

- ECLS
 - Lab ECLS systems operating nominally except for the CDRA
 - CDRA operating single-bed (when required)
 - Node smoke detector #2 R&R'd and now operational
 - SM Vozdukh operating on 2 of 3 CO₂ removal beds
 - CO₂ removal capability nominal (occasional fan problems)
 - Trace Contaminant System Charcoal bed manifested on UF-1
 - Air conditioner #2 (SKV 2) is down, awaiting spare compressor (both U.S. Lab CCAAs operational)
 - SM rapid depress response inhibited
 - Low Pressure warning enabled
(U.S. Lab rapid depress response enabled)
 - VOA not operational

Current On-Orbit Status

(continued)

- EPS
 - FGB EPS working nominally
 - 6 of 6 batteries operational
 - SM EPS working nominally
 - 7 of 8 batteries operational
 - P6 power channels 2B and 4B operating nominally
 - RPCMs
 - RPCM LAD22B-A has a bit flip in SRAM - cannot be refreshed (spare available if required)

Current On-Orbit Status

(continued)

- S&M
 - 3 of 4 Beta Gimbal Assembly (BGA) latching mechanisms locked
 - on starboard 4 Bar assembly
 - Latched port 4 Bar assembly on 5A.1
 - Strength analysis shows 3 of 4 acceptable for near term
 - 2B and 4B BGA showing high currents sporadically
 - When in XVV, 4B in directed position (to limit use), 2B in rate mode
 - Blankets and Low β X-POP planned to limit use
- TCS
 - Early External Active Thermal Control System operating within specs
 - Starboard radiator has one loop plumbed incorrectly
 - Heat rejection capability impacted - still meets heat rejection needs
 - ITCS operating nominally (see Special Topic)

Current On-Orbit Status

(continued)

- EVR
 - CanadArm2 operating nominally
- GN&C
 - CMG 1 and 2 have experienced loss of comm
 - CMG 2 appears to have a 24.5 deg bias in the outer gimbal
- Propulsion systems nominal and ready for UF-1 operations

Current On-Orbit Status (continued)

- EV&CS / GFE Hardware
 - TVIS (Treadmill) – Working
 - SLD cable jam - using Bungee Configuration, annual maintenance task
 - Annual Maintenance tasks and VIS repair and SLD repair “below the line” on UF-1
 - Impacts return of “old” hardware
 - CEVIS (arm and leg bicycle) – Restricted operations
 - Foot Pedal not functional, repair task required to perform PFE
 - Wire Rope isolators not connected to certified interface
 - Chit to return to configuration in work
 - VOA (air sample analyzer) – Not Operational
 - 3-4 month system validation process not started due to power problems
 - Additional troubleshooting required
 - TOCA (water sample analyzer) – Validation in progress, issues resolved
 - TEPC (radiation monitor) – Working – down link of data issues
 - Trouble shooting in progress